

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	(email e-mail) near5 meassg\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
L2	0	(email e-mail) near5 meassg\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
L3	69	(email e-mail) near5 messag\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
L4	259	updat\$4 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
L5	259	updat\$5 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
L6	0	(updat\$5 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)) and ((email e-mail) near6 messag\$4 near5 updat\$4 near5 database\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
L7	2844054	(email e-mail) near2 updat\$4 njeawr4 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
L8	72	(email e-mail) near6 messag\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
L9	5305	(e-mail email (electron\$4 near5 messag\$4)) near5 (updat\$4 chang\$4 modif\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:04

L10	86	L9 near5 (database\$4 document\$4) same network	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:04
L11	241	L9 near5 (database\$4 document\$4) same (transmit\$4 send\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:04
L12	2	"6654746".pn. and (clientnear4 computer near5 database)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:04
L13	390242	server\$4 enar5 receiv\$4 near5 quer\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:04
L14	8109	L13 and (server\$4 near5 (send\$4 forward\$3 transfer\$4 transmit\$4) near5 (asset\$4 database\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:04
L15	2844352	(email e-mail) near5 updat\$4 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:04
L16	3946948	predetermin\$4 near5 event\$4 caus\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:04
L17	21563	L16 and (database\$4 near5 updat\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:04
L18	355	(quer\$4) near5 (lifetim\$3 lifecycl\$3 expir\$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:04

L19	30	L18 and (distribut\$4 near5 quer\$4 )	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:04
L20	86	L9 near5 (database\$4 document\$4) same network	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:05
L21	241	L9 near5 (database\$4 document\$4) same (transmit\$4 send\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:05
L22	55	L20 and L21	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:05
L23	0	delop\$4 near5 system same problem\$4 near5 manag\$5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:10
L24	86	L9 near5 (database\$4 document\$4) same network	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:11
L25	376	develop\$4 near5 system same problem\$4 near5 manag\$5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:11
L26	931	email\$ near5 updat\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:11
L27	2	L25 and L26	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:11
L28	10075	L13 and (server\$4 near5 (send\$4 forward\$3 transfer\$4 transmit\$4 distribut\$4) near5 (asset\$4 database\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:11

L29	2	L28 and (identif\$4 check\$4 determin\$4 find\$3) near5 quer\$4 near5 lifetim\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:11
L30	2589	server\$4 near5 receiv\$4 near5 quer\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:11
L31	592	L30 and (server\$4 near5 (send\$4 forward\$3 transfer\$4 transmit\$4 distribut\$4) near5 (asset\$4 database\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:11
L32	1	L29 and L31	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:11
S1	2	"20030120657"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/04/21 11:03
S2	233005	(email e-mail) near5 updat\$4 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:27
S3	0	(email e-mail) near5 meassg\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S4	37	(email e-mail) near5 messag\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S5	143	updat\$4 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03

S6	143	updat\$5 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S7	143	(updat\$4 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)) and (updat\$5 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/04/22 11:15
S8	0	(updat\$5 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)) and ((email e-mail) near6 messag\$4 near5 updat\$4 near5 database\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S9	0	(updat\$4 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)) and ((email e-mail) near6 messag\$4 near5 updat\$4 near5 database\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/04/22 11:15
S10	233429	(email e-mail) near2 updat\$4 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/04/22 11:16
S11	233429	(email e-mail) near2 updat\$4 njeawr4 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S12	39	(email e-mail) near6 messag\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S13	3961	(e-mail email (electron\$4 near5 messag\$4)) near5 (updat\$4 chang\$4 modif\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/12/21 14:00
S14	459	S13 near5 (database\$4 document\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:28
S15	49	S13 near5 (database\$4 document\$4) same network	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:11

S16	159	S13 near5 (database\$4 document\$4) same (transmit\$4 send\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S17	31	S15 and S16	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:05
S18	2	"6654746".pn. and (clientnear4 computer near5 database)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S19	2	"6654746".pn. and (client near4 computer near5 database)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/12/21 15:44
S20	2	"6654746".pn. and ((client\$3 user\$3) near4 updat\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2004/12/21 15:45
S21	2813378	(email e-mail) near5 updat\$4 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S22	0	(email e-mail) near5 meassg\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:27
S23	60	(email e-mail) near5 messag\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:27
S24	226	updat\$5 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:27
S25	226	updat\$4 near5 (emial e-mail messag\$4) near5 (confirm\$3 acknowleg\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:28

S26	62	(email e-mail) near6 messag\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:28
S27	4684	(e-mail email (electron\$4 near5 messag\$4)) near5 (updat\$4 chang\$4 modif\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:28
S28	562	S27 near5 (database\$4 document\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:28
S29	62	(email e-mail) near6 messag\$4 near5 updat\$4 near5 database\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:28
S30	0	S29 and (detect\$4 near5 (problem\$3 defect\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:33
S31	0	S29 and (find\$4 near5 (problem\$3 defect\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:34
S32	164437	((find\$4 detect\$4) near5 (problem\$3 defect\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:34
S33	0	(test\$3 near5 indicent\$4 near5 report\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:35
S34	0	(test\$3 near5 indicident\$4 near5 report\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:35
S35	21	(test\$3 near5 incident\$4 near5 report\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:41

S36	3	S32 and S35	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:36
S37	3790250	predetermin\$4 near5 event\$4 caus\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:41
S38	19389	S37 and (database\$4 near5 updat\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:03
S39	576	predetermin\$4 near5 event\$4 near5 caus\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:42
S40	19389	S38 and (database\$4 near5 updat\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:42
S41	30	predetermin\$4 near5 event\$4 near5 caus\$4 and (databas\$3 near5 updat\$4.)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:44
S42	9	S41 and (email\$3 )	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:46
S43	0	delop\$4 near5 system same problem\$4 near5 manag\$5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:10
S44	348	develop\$4 near5 system same problem\$4 near5 manag\$5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:47
S45	28386	email	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:48

S46	51	S44 and S45	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:47
S47	805	email\$ near5 updat\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 15:48
S48	2	S44 and S47	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/22 11:11
S49	210	S27 near5 (database\$4 document\$4) same (transmit\$4 send\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 16:47
S50	218	asset\$4 near4 quer\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:12
S51	402	asset\$4 near4 configur\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 09:59
S52	51	S50 and S51	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:01
S53	25	S52 and (lifetime\$3 lifecycl\$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:05
S54	7	asset\$4 near4 (quer\$4 configur\$4) near5 (lifetim\$3 lifecycl\$3 expir\$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:14

S55	316	(quer\$4) near5 (lifetim\$3 lifecycl\$3 expir\$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:18
S56	0	S55 and (revclev\$4 near5 quer\$4 )	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:16
S57	0	S55 and (reciev\$4 near5 quer\$4 )	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:16
S58	191	S55 and (receiv\$4 near5 quer\$4 )	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:16
S59	27	S55 and (distribut\$4 near5 quer\$4 )	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:03
S60	26	S58 and S59	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:36
S61	1	quer\$4 near5 result\$4 near5 lifetim\$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:38
S62	41	quer\$4 near5 lifetim\$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:41

S63	351519	server\$4 enar5 receiv\$4 near5 quer\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:47
S64	7297	S63 and (server\$4 near5 (send\$4 forward\$3 transfer\$4 transmit\$4) near5 (asset\$4 database\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:03
S65	9078	S63 and (server\$4 near5 (send\$4 forward\$3 transfer\$4 transmit\$4 distribut\$4) near5 (asset\$4 database\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:47
S66	2	S65 and (identif\$4 check\$4 determin\$4 find\$3) near5 quer\$4 near5 lifetim\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:48
S67	19	S65 and (identif\$4 check\$4 determin\$4 find\$3) near5 lifetim\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:46
S68	2277	server\$4 near5 receiv\$4 near5 quer\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:47
S69	463	S68 and (server\$4 near5 (send\$4 forward\$3 transfer\$4 transmit\$4) near5 (asset\$4 database\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:47
S70	526	S68 and (server\$4 near5 (send\$4 forward\$3 transfer\$4 transmit\$4 distribut\$4) near5 (asset\$4 database\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:48

S71	1	S66 and S70	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/12/22 11:11
S72	2	S67 and S70	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/07/06 10:49

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Results 1 - 13 of 13

Relevance scale **1 GPGPU: general purpose computation on graphics hardware**

 David Luebke, Mark Harris, Jens Krüger, Tim Purcell, Naga Govindaraju, Ian Buck, Cliff Woolley, Aaron Lefohn

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

**Publisher:** ACM PressFull text available:  [pdf\(63.03 MB\)](#) Additional Information: [full citation](#), [abstract](#)

The graphics processor (GPU) on today's commodity video cards has evolved into an extremely powerful and flexible processor. The latest graphics architectures provide tremendous memory bandwidth and computational horsepower, with fully programmable vertex and pixel processing units that support vector operations up to full IEEE floating point precision. High level languages have emerged for graphics hardware, making this computational power accessible. Architecturally, GPUs are highly parallel s ...

**2 High dynamic range imaging**

 Paul Debevec, Erik Reinhard, Greg Ward, Sumanta Pattanaik

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

**Publisher:** ACM PressFull text available:  [pdf\(20.22 MB\)](#) Additional Information: [full citation](#), [abstract](#)

Current display devices can display only a limited range of contrast and colors, which is one of the main reasons that most image acquisition, processing, and display techniques use no more than eight bits per color channel. This course outlines recent advances in high-dynamic-range imaging, from capture to display, that remove this restriction, thereby enabling images to represent the color gamut and dynamic range of the original scene rather than the limited subspace imposed by current monitor ...

**3 Real-time volume graphics**

 Klaus Engel, Markus Hadwiger, Joe M. Kniss, Aaron E. Lefohn, Christof Rezk Salama, Daniel Weiskopf

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

**Publisher:** ACM PressFull text available:  [pdf\(7.63 MB\)](#) Additional Information: [full citation](#), [abstract](#)

The tremendous evolution of programmable graphics hardware has made high-quality

real-time volume graphics a reality. In addition to the traditional application of rendering volume data in scientific visualization, the interest in applying these techniques for real-time rendering of atmospheric phenomena and participating media such as fire, smoke, and clouds is growing rapidly. This course covers both applications in scientific visualization, e.g., medical volume data, and real-time rendering, ...

#### **4 Data and memory optimization techniques for embedded systems**

 P. R. Panda, F. Catthoor, N. D. Dutt, K. Danckaert, E. Brockmeyer, C. Kulkarni, A. Vandercappelle, P. G. Kjeldsberg

April 2001 **ACM Transactions on Design Automation of Electronic Systems (TODAES)**,

Volume 6 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(339.91 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present a survey of the state-of-the-art techniques used in performing data and memory-related optimizations in embedded systems. The optimizations are targeted directly or indirectly at the memory subsystem, and impact one or more out of three important cost metrics: area, performance, and power dissipation of the resulting implementation. We first examine architecture-independent optimizations in the form of code transformations. We next cover a broad spectrum of optimizati ...

**Keywords:** DRAM, SRAM, address generation, allocation, architecture exploration, code transformation, data cache, data optimization, high-level synthesis, memory architecture customization, memory power dissipation, register file, size estimation, survey

#### **5 Arithmetic coding revisited**

 Alistair Moffat, Radford M. Neal, Ian H. Witten

July 1998 **ACM Transactions on Information Systems (TOIS)**, Volume 16 Issue 3

**Publisher:** ACM Press

Full text available:  pdf(487.26 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Over the last decade, arithmetic coding has emerged as an important compression tool. It is now the method of choice for adaptive coding on myltisymbol alphabets because of its speed, low storage requirements, and effectiveness of compression. This article describes a new implementation of arithmetic coding that incorporates several improvements over a widely used earlier version by Witten, Neal, and Cleary, which has become a de facto standard. These improvements include f ...

**Keywords:** approximate coding, arithmetic coding, text compression, word-based model

#### **6 Authentication and authorization: Securing passwords against dictionary attacks**

 Benny Pinkas, Tomas Sander

November 2002 **Proceedings of the 9th ACM conference on Computer and communications security**

**Publisher:** ACM Press

Full text available:  pdf(216.72 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The use of passwords is a major point of vulnerability in computer security, as passwords are often easy to guess by automated programs running dictionary attacks. Passwords remain the most widely used authentication method despite their well-known security weaknesses. User authentication is clearly a practical problem. From the perspective of a service provider this problem needs to be solved within real-world constraints such as the available hardware and software infrastructures. From a user' ...

7 [Intrusion detection: Countering code-injection attacks with instruction-set randomization](#)



Gaurav S. KC, Angelos D. Keromytis, Vassilis Prevelakis

October 2003 **Proceedings of the 10th ACM conference on Computer and communications security**

Publisher: ACM Press

Full text available: [pdf\(146.35 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe a new, general approach for safeguarding systems against *any* type of code-injection attack. We apply Kerckhoff's principle, by creating process-specific randomized instruction sets (e.g., machine instructions) of the system executing potentially vulnerable software. An attacker who does not know the key to the randomization algorithm will inject code that is invalid for that randomized processor, causing a runtime exception. To determine the difficulty of integrating su ...

**Keywords:** buffer overflows, emulators, interpreters

8 [Geometric compression through topological surgery](#)



Gabriel Taubin, Jarek Rossignac

April 1998 **ACM Transactions on Graphics (TOG)**, Volume 17 Issue 2

Publisher: ACM Press

Full text available: [pdf\(8.98 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The abundance and importance of complex 3-D data bases in major industry segments, the affordability of interactive 3-D rendering for office and consumer use, and the exploitation of the Internet to distribute and share 3-D data have intensified the need for an effective 3-D geometric compression technique that would significantly reduce the time required to transmit 3-D models over digital communication channels, and the amount of memory or disk space required to store the models. Because ...

**Keywords:** 3D mesh compression, VRML, geometry compression

9 [With microscope and tweezers: the worm from MIT's perspective](#)



Jon A. Rochlis, Mark W. Eichin

June 1989 **Communications of the ACM**, Volume 32 Issue 6

Publisher: ACM Press

Full text available: [pdf\(1.22 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The actions taken by a group of computer scientists at MIT during the worm invasion represents a study of human response to a crisis. The authors also relate the experiences and reactions of other groups throughout the country, especially in terms of how they interacted with the MIT team.

10 [Modeling and assessing inference exposure in encrypted databases](#)



Alberto Ceselli, Ernesto Damiani, Sabrina De Capitani Di Vimercati, Sushil Jajodia, Stefano Paraboschi, Pierangela Samarati

February 2005 **ACM Transactions on Information and System Security (TISSEC)**, Volume 8 Issue 1

Publisher: ACM Press

Full text available: [pdf\(727.96 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The scope and character of today's computing environments are progressively shifting from traditional, one-on-one client-server interaction to the new cooperative paradigm. It then becomes of primary importance to provide means of protecting the secrecy of the information, while guaranteeing its availability to legitimate clients. Operating online querying services securely on open networks is very difficult; therefore many enterprises outsource their data center operations to external applicati ...

**Keywords:** Cryptography, database service, indexing, inference

**11 SwingWrapper: Retiling triangle meshes for better edgebreaker compression**



Marco Attene, Bianca Falcidieno, Michela Spagnuolo, Jarek Rossignac

October 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 4

**Publisher:** ACM Press

Full text available: pdf(176.57 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We focus on the lossy compression of manifold triangle meshes. Our SwingWrapper approach partitions the surface of an original mesh  $M$  into simply connected regions, called *triangloids*. From these, we generate a new mesh  $M'$ . Each triangle of  $M'$  is an approximation of a triangloid of  $M$ . By construction, the connectivity of  $M'$  is fairly regular and can be compressed to less than a bit per triangle using Edg ...

**Keywords:** Triangle mesh, geometry compression, remeshing, retiling, simplification

**12 Capturing, indexing, clustering, and retrieving system history**



Ira Cohen, Steve Zhang, Moises Goldszmidt, Julie Symons, Terence Kelly, Armando Fox

October 2005 **ACM SIGOPS Operating Systems Review , Proceedings of the twentieth ACM symposium on Operating systems principles SOSP '05**, Volume 39 Issue 5

**Publisher:** ACM Press

Full text available: pdf(516.41 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a method for automatically extracting from a running system an indexable *signature* that distills the essential characteristic from a system state and that can be subjected to automated clustering and similarity-based retrieval to identify when an observed system state is similar to a previously-observed state. This allows operators to identify and quantify the frequency of recurrent problems, to leverage previous diagnostic efforts, and to establish whether problems seen at dif ...

**Keywords:** bayesian networks, clustering, information retrieval, performance objectives, signatures

**13 Communications privacy: implications for network design**



Marc Rotenberg

August 1993 **Communications of the ACM**, Volume 36 Issue 8

**Publisher:** ACM Press

Full text available: pdf(2.91 MB)

Additional Information: [full citation](#), [references](#), [index terms](#), [review](#)

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Relevance scale

**1 GPGPU: general purpose computation on graphics hardware**

David Luebke, Mark Harris, Jens Krüger, Tim Purcell, Naga Govindaraju, Ian Buck, Cliff Woolley, Aaron Lefohn

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04****Publisher:** ACM PressFull text available: [pdf\(63.03 MB\)](#) Additional Information: [full citation](#), [abstract](#)

The graphics processor (GPU) on today's commodity video cards has evolved into an extremely powerful and flexible processor. The latest graphics architectures provide tremendous memory bandwidth and computational horsepower, with fully programmable vertex and pixel processing units that support vector operations up to full IEEE floating point precision. High level languages have emerged for graphics hardware, making this computational power accessible. Architecturally, GPUs are highly parallel s ...

**2 Real-time shading**

Marc Olano, Kurt Akeley, John C. Hart, Wolfgang Heidrich, Michael McCool, Jason L. Mitchell, Randi Rost

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04****Publisher:** ACM PressFull text available: [pdf\(7.39 MB\)](#) Additional Information: [full citation](#), [abstract](#)

Real-time procedural shading was once seen as a distant dream. When the first version of this course was offered four years ago, real-time shading was possible, but only with one-of-a-kind hardware or by combining the effects of tens to hundreds of rendering passes. Today, almost every new computer comes with graphics hardware capable of interactively executing shaders of thousands to tens of thousands of instructions. This course has been redesigned to address today's real-time shading capabili ...

**3 Real-time volume graphics**

Klaus Engel, Markus Hadwiger, Joe M. Kniss, Aaron E. Lefohn, Christof Rezk Salama, Daniel Weiskopf

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04****Publisher:** ACM PressFull text available: [pdf\(7.63 MB\)](#) Additional Information: [full citation](#), [abstract](#)

The tremendous evolution of programmable graphics hardware has made high-quality real-time volume graphics a reality. In addition to the traditional application of rendering volume data in scientific visualization, the interest in applying these techniques for real-time rendering of atmospheric phenomena and participating media such as fire, smoke, and clouds is growing rapidly. This course covers both applications in scientific visualization, e.g., medical volume data, and real-time rendering, ...

#### **4 High dynamic range imaging**

 Paul Debevec, Erik Reinhard, Greg Ward, Sumanta Pattanaik  
August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

**Publisher:** ACM Press

Full text available:  pdf(20.22 MB) Additional Information: [full citation](#), [abstract](#)

Current display devices can display only a limited range of contrast and colors, which is one of the main reasons that most image acquisition, processing, and display techniques use no more than eight bits per color channel. This course outlines recent advances in high-dynamic-range imaging, from capture to display, that remove this restriction, thereby enabling images to represent the color gamut and dynamic range of the original scene rather than the limited subspace imposed by current monitor ...

#### **5 Frontmatter (TOC, Letters, Election results, Software Reliability Resources!)**

 Computing Curricula 2004 and the Software Engineering Volume SE2004, Software Reuse Research, ICSE 2005 Forward)

July 2005 **ACM SIGSOFT Software Engineering Notes**, Volume 30 Issue 4

**Publisher:** ACM Press

Full text available:  pdf(6.19 MB) Additional Information: [full citation](#)

#### **6 Risks to the public: Risks to the public**

 Peter G. Neumann  
July 2005 **ACM SIGSOFT Software Engineering Notes**, Volume 30 Issue 4

**Publisher:** ACM Press

Full text available:  pdf(151.77 KB) Additional Information: [full citation](#), [abstract](#)

Edited by Peter G. Neumann (Risks Forum Moderator and Chairman of the ACM Committee on Computers and Public Policy), plus personal contributions by others, as indicated. Opinions expressed are individual rather than organizational, and all of the usual disclaimers apply. We address problems relating to software, hardware, people, and other circumstances relating to computer systems. To economize on space, we include pointers to items in the online Risks Forum: (R i j) denotes RISKS vol i number ...

#### **7 The elements of nature: interactive and realistic techniques**

 Oliver Deussen, David S. Ebert, Ron Fedkiw, F. Kenton Musgrave, Przemyslaw Prusinkiewicz, Doug Roble, Jos Stam, Jerry Tessendorf  
August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

**Publisher:** ACM Press

Full text available:  pdf(17.65 MB) Additional Information: [full citation](#), [abstract](#)

This updated course on simulating natural phenomena will cover the latest research and production techniques for simulating most of the elements of nature. The presenters will provide movie production, interactive simulation, and research perspectives on the difficult task of photorealistic modeling, rendering, and animation of natural phenomena. The course offers a nice balance of the latest interactive graphics hardware-based

simulation techniques and the latest physics-based simulation techni ...

**8 Flow analysis for verifying properties of concurrent software systems**

Matthew B. Dwyer, Lori A. Clarke, Jamieson M. Cobleigh, Gleb Naumovich

October 2004 **ACM Transactions on Software Engineering and Methodology (TOSEM)**,  
Volume 13 Issue 4

**Publisher:** ACM Press

Full text available:  pdf(1.13 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This article describes FLAVERS, a finite-state verification approach that analyzes whether concurrent systems satisfy user-defined, behavioral properties. FLAVERS automatically creates a compact, event-based model of the system that supports efficient dataflow analysis. FLAVERS achieves this efficiency at the cost of precision. Analysts, however, can improve the precision of analysis results by selectively and judiciously incorporating additional semantic information into an analysis. We report o ...

**Keywords:** Dataflow analysis, finite-state verification, model checking

**9 Data and memory optimization techniques for embedded systems**

P. R. Panda, F. Catthoor, N. D. Dutt, K. Danckaert, E. Brockmeyer, C. Kulkarni, A.

Vandercappelle, P. G. Kjeldsberg

April 2001 **ACM Transactions on Design Automation of Electronic Systems (TODAES)**,  
Volume 6 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(339.91 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present a survey of the state-of-the-art techniques used in performing data and memory-related optimizations in embedded systems. The optimizations are targeted directly or indirectly at the memory subsystem, and impact one or more out of three important cost metrics: area, performance, and power dissipation of the resulting implementation. We first examine architecture-independent optimizations in the form of code transformations. We next cover a broad spectrum of optimizati ...

**Keywords:** DRAM, SRAM, address generation, allocation, architecture exploration, code transformation, data cache, data optimization, high-level synthesis, memory architecture customization, memory power dissipation, register file, size estimation, survey

**10 A concurrency analysis tool suite for Ada programs: rationale, design, and**

**preliminary experience**

Michal Young, Richard N. Taylor, David L. Levine, Kari A. Nies, Debra Brodbeck

January 1995 **ACM Transactions on Software Engineering and Methodology (TOSEM)**,  
Volume 4 Issue 1

**Publisher:** ACM Press

Full text available:  pdf(2.93 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Cats (Concurrency Analysis Tool Suite) is designed to satisfy several criteria: it must analyze implementation-level Ada source code and check user-specified conditions associated with program source code; it must be modularized in a fashion that supports flexible composition with other tool components, including integration with a variety of testing and analysis techniques; and its performance and capacity must be sufficient for analysis of real application programs. Meeting these objectiv ...

**Keywords:** Ada, concurrency, software development environments, static analysis, tool integration

**11 The importance of translucence in mobile computing systems**

 Maria R. Ebling, Bonnie E. John, M. Satyanarayanan

March 2002 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 9 Issue 1

Publisher: ACM Press

Full text available:  pdf(330.59 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Mobile computing has been an active area of research for the past decade, but its importance will increase substantially in the decade to come. One problem faced by designers of mobile systems is that of maintaining the illusion of connectivity even when network performance is poor or non-existent. The Coda file system uses its cache to maintain this illusion. Extensive experience with the system suggests that, although users find the functionality provided by the system extremely valuable, new ...

**Keywords:** Coda, disconnected operation, mobile computing, translucent cache management, weakly connected operation

**12 Authentication and authorization: Securing passwords against dictionary attacks**

 Benny Pinkas, Tomas Sander

November 2002 **Proceedings of the 9th ACM conference on Computer and communications security**

Publisher: ACM Press

Full text available:  pdf(216.72 KB)

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**13 SOS: secure overlay services**

 Angelos D. Keromytis, Vishal Misra, Dan Rubenstein

August 2002 **ACM SIGCOMM Computer Communication Review , Proceedings of the 2002 conference on Applications, technologies, architectures, and protocols for computer communications SIGCOMM '02**, Volume 32 Issue 4

Publisher: ACM Press

Full text available:  pdf(210.90 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Denial of service (DoS) attacks continue to threaten the reliability of networking systems. Previous approaches for protecting networks from DoS attacks are reactive in that they wait for an attack to be launched before taking appropriate measures to protect the network. This leaves the door open for other attacks that use more sophisticated methods to mask their traffic. We propose an architecture called Secure Overlay Services (SOS) that proactively prevents DoS attacks, geared toward supportin ...

**Keywords:** denial of service attacks, network security, overlay networks

**14**

**Terrain database interoperability issues in training with distributed interactive simulation**

 Guy A. Schiavone, S. Sureshchandran, Kenneth C. Hardis  
July 1997 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 7 Issue 3  
**Publisher:** ACM Press

Full text available:  pdf(443.34 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

In Distributed Interactive Simulation (DIS), each participating node is responsible for maintaining its own model of the synthetic environment. Problems may arise if significant inconsistencies are allowed to exist between these separate world views, resulting in unrealistic simulation results or negative training, and a corresponding degradation of interoperability in a DIS simulation exercise. In the DIS community, this is known as the simulator terrain database (TDB) correlation problem. ...

**Keywords:** distributed interactive simulation, terrain databases

**15 Risks to the public: Risks to the public in computers and related systems** 

 Peter G. Neumann  
May 2004 **ACM SIGSOFT Software Engineering Notes**, Volume 29 Issue 3  
**Publisher:** ACM Press

Full text available:  pdf(128.46 KB) Additional Information: [full citation](#)

**16 A safe, efficient regression test selection technique** 

 Gregg Rothermel, Mary Jean Harrold  
April 1997 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 6 Issue 2  
**Publisher:** ACM Press

Full text available:  pdf(730.74 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Regression testing is an expensive but necessary maintenance activity performed on modified software to provide confidence that changes are correct and do not adversely affect other portions of the software. A regression test selection technique chooses, from an existing test set, tests that are deemed necessary to validate modified software. We present a new technique for regression test selection. Our algorithms construct control flow graphs for a procedure or program and its modified ver ...

**Keywords:** regression test selection, regression testing, selective retest

**17 Information extraction as a basis for high-precision text classification** 

 Ellen Riloff, Wendy Lehnert  
July 1994 **ACM Transactions on Information Systems (TOIS)**, Volume 12 Issue 3  
**Publisher:** ACM Press

Full text available:  pdf(2.79 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

We describe an approach to text classification that represents a compromise between traditional word-based techniques and in-depth natural language processing. Our approach uses a natural language processing task called "information extraction" as a basis for high-precision text classification. We present three algorithms that use varying amounts of extracted information to classify texts. The relevancy signatures algorithm uses linguistic phrases; the a ...

**Keywords:** information extraction, text classification

**18 Software quality and process: Predictors of customer perceived software quality** Audris Mockus, Ping Zhang, Paul Luo Li May 2005 **Proceedings of the 27th international conference on Software engineering****Publisher:** ACM PressFull text available:  pdf(107.20 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Predicting software quality as perceived by a customer may allow an organization to adjust deployment to meet the quality expectations of its customers, to allocate the appropriate amount of maintenance resources, and to direct quality improvement efforts to maximize the return on investment. However, customer perceived quality may be affected not simply by the software content and the development process, but also by a number of other factors including deployment issues, amount of usage, softwa ...

**Keywords:** metrics, modeling, quality**19 Separating the wheat from the chaff in Internet-mediated user feedback expectation-** driven event monitoring David M. Hilbert, David F. RedmilesApril 1999 **ACM SIGGROUP Bulletin**, Volume 20 Issue 1**Publisher:** ACM PressFull text available:  pdf(1.14 MB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

The Internet enables cheap, rapid, and large-scale distribution of software for evaluation purposes. It also presents hitherto unprecedented, and currently underutilized, opportunities for increasing user-developer communication in software development. For instance, the Internet can be used as a medium for collecting "direct" user feedback in the form of subjective user reports, as well as "indirect" feedback in the form of automatically-captured data about application and user behavior. Both o ...

**Keywords:** Internet-mediated user-developer communication, expectation-driven event monitoring, remote usability evaluation, user feedback**20 Graph models for reachability analysis of concurrent programs** Mauro Pezzè, Richard N. Taylor, Michal Young April 1995 **ACM Transactions on Software Engineering and Methodology (TOSEM)**,

Volume 4 Issue 2

**Publisher:** ACM PressFull text available:  pdf(3.00 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The problem of analyzing concurrent systems has been investigated by many researchers, and several solutions have been proposed. Among the proposed techniques, reachability analysis—systematic enumeration of reachable states in a finite-state model—is attractive because it is conceptually simple and relatively straightforward to automate and can be used in conjunction with model-checking procedures to check for application-specific as well as general properties. This article sho ...

**Keywords:** Ada tasking, process algebra, static analysis

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### 21 [Geometric compression through topological surgery](#)

Gabriel Taubin, Jarek Rossignac

April 1998 **ACM Transactions on Graphics (TOG)**, Volume 17 Issue 2

Publisher: ACM Press

Full text available: [pdf\(8.98 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

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**Keywords:** 3D mesh compression, VRML, geometry compression

### 22 [The design, implementation and operation of an email pseudonym server](#)

David Mazières, M. Frans Kaashoek

November 1998 **Proceedings of the 5th ACM conference on Computer and communications security**

Publisher: ACM Press

Full text available: [pdf\(1.29 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

### 23 [Intrusion detection: Countering code-injection attacks with instruction-set randomization](#)

Gaurav S. Kc, Angelos D. Keromytis, Vassilis Prevelakis

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**Keywords:** buffer overflows, emulators, interpreters

**24** Arithmetic coding revisited

 Alistair Moffat, Radford M. Neal, Ian H. Witten

July 1998 **ACM Transactions on Information Systems (TOIS)**, Volume 16 Issue 3

**Publisher:** ACM Press

Full text available:  pdf(487.26 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

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**Keywords:** approximate coding, arithmetic coding, text compression, word-based model

**25** Modeling and assessing inference exposure in encrypted databases

 Alberto Ceselli, Ernesto Damiani, Sabrina De Capitani Di Vimercati, Sushil Jajodia, Stefano

Paraboschi, Pierangela Samarati

February 2005 **ACM Transactions on Information and System Security (TISSEC)**, Volume 8  
Issue 1

**Publisher:** ACM Press

Full text available:  pdf(727.96 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

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**Keywords:** Cryptography, database service, indexing, inference

**26** Foreground and background interaction with sensor-enhanced mobile devices

 Ken Hinckley, Jeff Pierce, Eric Horvitz, Mike Sinclair

March 2005 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 12 Issue 1

**Publisher:** ACM Press

Full text available:  pdf(1.09 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Building on Buxton's foreground/background model, we discuss the importance of explicitly considering both foreground interaction and background interaction, as well as transitions between foreground and background, in the design and implementation of sensing techniques for sensor-enhanced mobile devices. Our view is that the *foreground* concerns deliberate user activity where the user is attending to the device, while the *background* is the realm of inattention or split attention, u ...

**Keywords:** Human-computer interaction, augmented devices, context awareness, input devices, interaction techniques, sensing

**27** With microscope and tweezers: the worm from MIT's perspective

Jon A. Rochlis, Mark W. Eichin

June 1989 **Communications of the ACM**, Volume 32 Issue 6



Publisher: ACM Press

Full text available: pdf(1.22 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The actions taken by a group of computer scientists at MIT during the worm invasion represents a study of human response to a crisis. The authors also relate the experiences and reactions of other groups throughout the country, especially in terms of how they interacted with the MIT team.

**28 Ext3cow: a time-shifting file system for regulatory compliance**



Zachary Peterson, Randal Burns

**May 2005 ACM Transactions on Storage (TOS), Volume 1 Issue 2**

Publisher: ACM Press

Full text available: pdf(443.01 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The ext3cow file system, built on the popular ext3 file system, provides an open-source file versioning and snapshot platform for compliance with the versioning and auditability requirements of recent electronic record retention legislation. Ext3cow provides a *time-shifting* interface that permits a real-time and continuous view of data in the past. Time-shifting does not pollute the file system namespace nor require snapshots to be mounted as a separate file system. Further, ext3cow is i ...

**Keywords:** Versioning file systems, copy-on-write

**29 Living on the bleeding edge: creating and managing highly specialized student labs**



Deborah Cherry, Paul Phillabaum, Pomona Valero

**October 2000 Proceedings of the 28th annual ACM SIGUCCS conference on User services: Building the future**

Publisher: ACM Press

Full text available: pdf(211.74 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

**Keywords:** audio, digital media, high-end, labs, multimedia, specialty, video

**30 Projectors: advanced graphics and vision techniques**



Ramesh Raskar

**August 2004 Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

Publisher: ACM Press

Full text available: pdf(6.53 MB) Additional Information: [full citation](#)

**31 Information warfare: Learning attack strategies from intrusion alerts**



Peng Ning, Dingbang Xu

**October 2003 Proceedings of the 10th ACM conference on Computer and communications security**

Publisher: ACM Press

Full text available: pdf(248.17 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Understanding strategies of attacks is crucial for security applications such as computer and network forensics, intrusion response, and prevention of future attacks. This paper presents techniques to automatically learn attack strategies from correlated intrusion alerts. Central to these techniques is a model that represents an attack strategy as a graph of attacks with

constraints on the attack attributes and the temporal order among these attacks. To learn the intrusion strategy is then to ex ...

**Keywords:** alert correlation, intrusion detection, profiling attack strategies

**32 Extending Java for high-level Web service construction**

 Aske Simon Christensen, Anders Møller, Michael I. Schwartzbach

November 2003 **ACM Transactions on Programming Languages and Systems (TOPLAS)**,

Volume 25 Issue 6

**Publisher:** ACM Press

Full text available:  pdf(947.02 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We incorporate innovations from the <bigwig> project into the Java language to provide high-level features for Web service programming. The resulting language, JWG, contains an advanced session model and a flexible mechanism for dynamic construction of XML documents, in particular XHTML. To support program development we provide a suite of program analyses that at compile time verify for a given program that no runtime errors can occur while building documents or receiving form input, and ...

**Keywords:** Interactive Web services, XML, data-flow analysis

**33 Industrial/government track: Information awareness: a prospective technical assessment**

 David Jensen, Matthew Rattigan, Hannah Blau

August 2003 **Proceedings of the ninth ACM SIGKDD international conference on Knowledge discovery and data mining**

**Publisher:** ACM Press

Full text available:  pdf(987.48 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Recent proposals to apply data mining systems to problems in law enforcement, national security, and fraud detection have attracted both media attention and technical critiques of their expected accuracy and impact on privacy. Unfortunately, the majority of technical critiques have been based on simplistic assumptions about data, classifiers, inference procedures, and the overall architecture of such systems. We consider these critiques in detail, and we construct a simulation model that more cl ...

**Keywords:** TIA, collective classification, information awareness, iterative classification, privacy, ranking classifiers, relational data mining, social network analysis, technology assessment

**34 Boolean operations on 3D selective Nef complexes: optimized implementation and experiments**

 Peter Hachenberger, Lutz Kettner

June 2005 **Proceedings of the 2005 ACM symposium on Solid and physical modeling**

**Publisher:** ACM Press

Full text available:  pdf(402.53 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Nef polyhedra in  $d$ -dimensional space are the closure of half-spaces under boolean set operation. In consequence, they can represent non-manifold situations, open and closed sets, mixed-dimensional complexes and they are closed under all boolean and topological operations, such as complement and boundary. They were introduced by W. Nef in his seminal 1978 book on polyhedra. We presented in previous work a new data structure for the boundary representation of three-dimensional Nef polyhedra ...

**Keywords:** B-rep, CSG, algorithms, benchmark, boundary evaluation, completeness, data structures, exactness, experiments, nef polyhedra, non-manifold, robustness, unbounded

polyhedra

**35 Computer security and impact on computer science education**

T. Andrew Yang

April 2001 **Journal of Computing Sciences in Colleges , Proceedings of the sixth annual CCSC northeastern conference on The journal of computing in small colleges,**  
Volume 16 Issue 4

**Publisher:** Consortium for Computing Sciences in Colleges , Consortium for Computing Sciences in Colleges

Full text available:  pdf(160.91 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The integration of computer security into existing Computer Science undergraduate education is an urgent and complicated task. With the increasing risk of computer intrusion, computer crimes and information wars, Computer Science educators bear the responsibility of cultivating a new generation of graduates who are aware of computer security related issues and are equipped with proper knowledge and skills to solve the problems. The task of integrating computer security into existing Computer ...

**36 Hypothesizing and reasoning about attacks missed by intrusion detection systems**

 Peng Ning, Dingbang Xu

November 2004 **ACM Transactions on Information and System Security (TISSEC)**, Volume 7  
Issue 4

**Publisher:** ACM Press

Full text available:  pdf(733.56 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Several alert correlation methods have been proposed over the past several years to construct high-level attack scenarios from low-level intrusion alerts reported by intrusion detection systems (IDSs). However, all of these methods depend heavily on the underlying IDSs, and cannot deal with attacks missed by IDSs. In order to improve the performance of intrusion alert correlation and reduce the impact of missed attacks, this paper presents a series of techniques to hypothesize and reason about a ...

**Keywords:** Intrusion alert correlation, intrusion detection, missed attacks

**37 SwingWrapper: Retiling triangle meshes for better edgebreaker compression**

 Marco Attene, Bianca Falcidieno, Michela Spagnuolo, Jarek Rossignac

October 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 4

**Publisher:** ACM Press

Full text available:  pdf(176.57 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We focus on the lossy compression of manifold triangle meshes. Our SwingWrapper approach partitions the surface of an original mesh  $M$  into simply connected regions, called *triangloids*. From these, we generate a new mesh  $M'$ . Each triangle of  $M'$  is an approximation of a triangloid of  $M$ . By construction, the connectivity of  $M'$  is fairly regular and can be compressed to less than a bit per triangle using Edg ...

**Keywords:** Triangle mesh, geometry compression, remeshing, retiling, simplification

**38 Distributed cognition: toward a new foundation for human-computer interaction research**

 James Hollan, Edwin Hutchins, David Kirsh

June 2000 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 7 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(123.64 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We are quickly passing through the historical moment when people work in front of a single

computer, dominated by a small CRT and focused on tasks involving only local information. Networked computers are becoming ubiquitous and are playing increasingly significant roles in our lives and in the basic infrastructures of science, business, and social interaction. For human-computer interaction to advance in the new millennium we need to better understand the emerging dynamic of interaction in ...

**Keywords:** cognitive science, distributed cognition, ethnography, human-computer interaction, research methodology

**39** [Capturing, indexing, clustering, and retrieving system history](#)

 Ira Cohen, Steve Zhang, Moises Goldszmidt, Julie Symons, Terence Kelly, Armando Fox  
October 2005 **ACM SIGOPS Operating Systems Review , Proceedings of the twentieth ACM symposium on Operating systems principles SOSP '05**, Volume 39 Issue 5

Publisher: ACM Press

Full text available:  pdf(516.41 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a method for automatically extracting from a running system an indexable *signature* that distills the essential characteristic from a system state and that can be subjected to automated clustering and similarity-based retrieval to identify when an observed system state is similar to a previously-observed state. This allows operators to identify and quantify the frequency of recurrent problems, to leverage previous diagnostic efforts, and to establish whether problems seen at dif ...

**Keywords:** bayesian networks, clustering, information retrieval, performance objectives, signatures

**40** [Four dark corners of requirements engineering](#)

 Pamela Zave, Michael Jackson  
January 1997 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 6 Issue 1

Publisher: ACM Press

Full text available:  pdf(434.26 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Research in requirements engineering has produced an extensive body of knowledge, but there are four areas in which the foundation of the discipline seems weak or obscure. This article shines some light in the "four dark corners," exposing problems and proposing solutions. We show that all descriptions involved in requirements engineering should be descriptions of the environment. We show that certain control information is necessary for sound requirements engineering, and we ex ...

**Keywords:** control of actions, domain knowledge, implementation bias, refinement of requirements

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Relevance scale

**41 Communications privacy: implications for network design**

Marc Rotenberg

 August 1993 **Communications of the ACM**, Volume 36 Issue 8**Publisher:** ACM PressFull text available: [pdf\(2.91 MB\)](#)Additional Information: [full citation](#), [references](#), [index terms](#), [review](#)**42 Bias in computer systems**

Batya Friedman, Helen Nissenbaum

 July 1996 **ACM Transactions on Information Systems (TOIS)**, Volume 14 Issue 3**Publisher:** ACM PressFull text available: [pdf\(185.46 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

From an analysis of actual cases, three categories of bias in computer systems have been developed: preexisting, technical, and emergent. Preexisting bias has its roots in social institutions, practices, and attitudes. Technical bias arises from technical constraints of considerations. Emergent bias arises in a context of use. Although others have pointed to bias in particular computer systems and have noted the general problem, we know of no comparable work that examines this phenomenon com ...

**Keywords:** bias, computer ethics, computers and society, design methods, ethics, human values, social computing, social impact, standards, system design, universal design, values

**43 Attacking information visualization system usability overloading and deceiving the human**

Gregory Conti, Mustaque Ahamed, John Stasko

July 2005 **Proceedings of the 2005 symposium on Usable privacy and security SOUPS '05****Publisher:** ACM PressFull text available: [pdf\(682.30 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Information visualization is an effective way to easily comprehend large amounts of data. For such systems to be truly effective, the information visualization designer must be

aware of the ways in which their system may be manipulated and protect their users from attack. In addition, users should be aware of potential attacks in order to minimize or negate their effect. These attacks target the information visualization system as well as the perceptual, cognitive and motor capabilities of human ...

**Keywords:** denial of information, information visualization, malicious visualizations, secure visualization, usability attacks

**44 Session 2: Defending against hitlist worms using network address space randomization**

S. Antonatos, P. Akrigidis, E. P. Markatos, K. G. Anagnostakis  
November 2005 **Proceedings of the 2005 ACM workshop on Rapid malcode WORM '05**

**Publisher:** ACM Press

Full text available:  [pdf\(433.30 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Worms are self-replicating malicious programs that represent a major security threat for the Internet, as they can infect and damage a large number of vulnerable hosts at timescales where human responses are unlikely to be effective. Sophisticated worms that use precomputed hitlists of vulnerable targets are especially hard to contain, since they are harder to detect, and spread at rates where even automated defenses may not be able to react in a timely fashion. This paper examines a new proactive ...

**Keywords:** internet worms, network security, randomization, traffic analysis

**45 Posters/Demos: iam: experiences with persistent video recording, publishing and sharing**

Tripp Millican  
November 2005 **Proceedings of the 2nd ACM workshop on Continuous archival and retrieval of personal experiences CARPE '05**

**Publisher:** ACM Press

Full text available:  [pdf\(540.46 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Creating and sharing persistent videos of personal experience presents an array of hardware and software issues. The hardware system to capture mobile personal experience digitally is not currently available "out of the box" and sharing hundreds of hours of video footage presents complex design and usability issues. iam is a research project to explore, catalogue and share user created point-of-view video. The project takes a more extreme position than current vloggers (video bloggers) by focusi ...

**Keywords:** archiving, augmented memory, first person video, internet, personal experience, video recording, vlogging, weblogging

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**1 GPGPU: general purpose computation on graphics hardware**

David Luebke, Mark Harris, Jens Krüger, Tim Purcell, Naga Govindaraju, Ian Buck, Cliff Woolley, Aaron Lefohn

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

**Publisher:** ACM PressFull text available: [pdf \(63.03 MB\)](#) Additional Information: [full citation](#), [abstract](#)

The graphics processor (GPU) on today's commodity video cards has evolved into an extremely powerful and flexible processor. The latest graphics architectures provide tremendous memory bandwidth and computational horsepower, with fully programmable vertex and pixel processing units that support vector operations up to full IEEE floating point precision. High level languages have emerged for graphics hardware, making this computational power accessible. Architecturally, GPUs are highly parallel s ...

**2 High dynamic range imaging**

Paul Debevec, Erik Reinhard, Greg Ward, Sumanta Pattanaik

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

**Publisher:** ACM PressFull text available: [pdf \(20.22 MB\)](#) Additional Information: [full citation](#), [abstract](#)

Current display devices can display only a limited range of contrast and colors, which is one of the main reasons that most image acquisition, processing, and display techniques use no more than eight bits per color channel. This course outlines recent advances in high-dynamic-range imaging, from capture to display, that remove this restriction, thereby enabling images to represent the color gamut and dynamic range of the original scene rather than the limited subspace imposed by current monitor ...

**3 Real-time volume graphics**

Klaus Engel, Markus Hadwiger, Joe M. Kniss, Aaron E. Lefohn, Christof Rezk Salama, Daniel Weiskopf

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

**Publisher:** ACM PressFull text available: [pdf \(7.63 MB\)](#) Additional Information: [full citation](#), [abstract](#)

The tremendous evolution of programmable graphics hardware has made high-quality

real-time volume graphics a reality. In addition to the traditional application of rendering volume data in scientific visualization, the interest in applying these techniques for real-time rendering of atmospheric phenomena and participating media such as fire, smoke, and clouds is growing rapidly. This course covers both applications in scientific visualization, e.g., medical volume data, and real-time rendering, ...

#### 4 Data and memory optimization techniques for embedded systems

 P. R. Panda, F. Catthoor, N. D. Dutt, K. Danckaert, E. Brockmeyer, C. Kulkarni, A. Vandercappelle, P. G. Kjeldsberg

April 2001 **ACM Transactions on Design Automation of Electronic Systems (TODAES)**, Volume 6 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(339.91 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present a survey of the state-of-the-art techniques used in performing data and memory-related optimizations in embedded systems. The optimizations are targeted directly or indirectly at the memory subsystem, and impact one or more out of three important cost metrics: area, performance, and power dissipation of the resulting implementation. We first examine architecture-independent optimizations in the form of code transformations. We next cover a broad spectrum of optimizati ...

**Keywords:** DRAM, SRAM, address generation, allocation, architecture exploration, code transformation, data cache, data optimization, high-level synthesis, memory architecture customization, memory power dissipation, register file, size estimation, survey

#### 5 Arithmetic coding revisited

 Alistair Moffat, Radford M. Neal, Ian H. Witten

July 1998 **ACM Transactions on Information Systems (TOIS)**, Volume 16 Issue 3

**Publisher:** ACM Press

Full text available:  pdf(487.26 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Over the last decade, arithmetic coding has emerged as an important compression tool. It is now the method of choice for adaptive coding on myltisymbol alphabets because of its speed, low storage requirements, and effectiveness of compression. This article describes a new implementation of arithmetic coding that incorporates several improvements over a widely used earlier version by Witten, Neal, and Cleary, which has become a de facto standard. These improvements include f ...

**Keywords:** approximate coding, arithmetic coding, text compression, word-based model

#### 6 Intrusion detection: Countering code-injection attacks with instruction-set randomization

 Gaurav S. Kc, Angelos D. Keromytis, Vassilis Prevelakis

October 2003 **Proceedings of the 10th ACM conference on Computer and communications security**

**Publisher:** ACM Press

Full text available:  pdf(146.35 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe a new, general approach for safeguarding systems against *any* type of code-injection attack. We apply Kerckhoff's principle, by creating process-specific randomized instruction sets (e.g., machine instructions) of the system executing potentially vulnerable software. An attacker who does not know the key to the randomization algorithm will inject code that is invalid for that randomized processor, causing a runtime exception. To

determine the difficulty of integrating su ...

**Keywords:** buffer overflows, emulators, interpreters

**7 Authentication and authorization: Securing passwords against dictionary attacks**

 Benny Pinkas, Tomas Sander

November 2002 **Proceedings of the 9th ACM conference on Computer and communications security**

**Publisher:** ACM Press

Full text available:  pdf(216.72 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The use of passwords is a major point of vulnerability in computer security, as passwords are often easy to guess by automated programs running dictionary attacks. Passwords remain the most widely used authentication method despite their well-known security weaknesses. User authentication is clearly a practical problem. From the perspective of a service provider this problem needs to be solved within real-world constraints such as the available hardware and software infrastructures. From a user' ...

**8 Geometric compression through topological surgery**

 Gabriel Taubin, Jarek Rossignac

April 1998 **ACM Transactions on Graphics (TOG)**, Volume 17 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(8.98 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The abundance and importance of complex 3-D data bases in major industry segments, the affordability of interactive 3-D rendering for office and consumer use, and the exploitation of the Internet to distribute and share 3-D data have intensified the need for an effective 3-D geometric compression technique that would significantly reduce the time required to transmit 3-D models over digital communication channels, and the amount of memory or disk space required to store the models. Because ...

**Keywords:** 3D mesh compression, VRML, geometry compression

**9 With microscope and tweezers: the worm from MIT's perspective**

 Jon A. Rochlis, Mark W. Eichin

June 1989 **Communications of the ACM**, Volume 32 Issue 6

**Publisher:** ACM Press

Full text available:  pdf(1.22 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The actions taken by a group of computer scientists at MIT during the worm invasion represents a study of human response to a crisis. The authors also relate the experiences and reactions of other groups throughout the country, especially in terms of how they interacted with the MIT team.

**10 Modeling and assessing inference exposure in encrypted databases**

 Alberto Ceselli, Ernesto Damiani, Sabrina De Capitani Di Vimercati, Sushil Jajodia, Stefano Paraboschi, Pierangela Samarati

February 2005 **ACM Transactions on Information and System Security (TISSEC)**, Volume 8 Issue 1

**Publisher:** ACM Press

Full text available:  pdf(727.96 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The scope and character of today's computing environments are progressively shifting from traditional, one-on-one client-server interaction to the new cooperative paradigm. It then becomes of primary importance to provide means of protecting the secrecy of the information, while guaranteeing its availability to legitimate clients. Operating online querying services securely on open networks is very difficult; therefore many enterprises outsource their data center operations to external applicati ...

**Keywords:** Cryptography, database service, indexing, inference

**11 SwingWrapper: Retiling triangle meshes for better edgebreaker compression**

 Marco Attene, Bianca Falcidieno, Michela Spagnuolo, Jarek Rossignac  
October 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 4

**Publisher:** ACM Press

Full text available:  pdf(176.57 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We focus on the lossy compression of manifold triangle meshes. Our SwingWrapper approach partitions the surface of an original mesh  $M$  into simply connected regions, called *triangloids*. From these, we generate a new mesh  $M'$ . Each triangle of  $M'$  is an approximation of a triangloid of  $M$ . By construction, the connectivity of  $M'$  is fairly regular and can be compressed to less than a bit per triangle using Edg ...

**Keywords:** Triangle mesh, geometry compression, remeshing, retiling, simplification

**12 Capturing, indexing, clustering, and retrieving system history**

 Ira Cohen, Steve Zhang, Moises Goldszmidt, Julie Symons, Terence Kelly, Armando Fox  
October 2005 **ACM SIGOPS Operating Systems Review , Proceedings of the twentieth ACM symposium on Operating systems principles SOSP '05**, Volume 39 Issue 5

**Publisher:** ACM Press

Full text available:  pdf(516.41 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a method for automatically extracting from a running system an indexable *signature* that distills the essential characteristic from a system state and that can be subjected to automated clustering and similarity-based retrieval to identify when an observed system state is similar to a previously-observed state. This allows operators to identify and quantify the frequency of recurrent problems, to leverage previous diagnostic efforts, and to establish whether problems seen at dif ...

**Keywords:** bayesian networks, clustering, information retrieval, performance objectives, signatures

**13 Communications privacy: implications for network design**

 Marc Rotenberg  
August 1993 **Communications of the ACM**, Volume 36 Issue 8

**Publisher:** ACM Press

Full text available:  pdf(2.91 MB) Additional Information: [full citation](#), [references](#), [index terms](#), [review](#)

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